

STORAGE RACK FOR BOTTLES AND JARS

[0001] Cross-Reference to Related Application

[0002] Applicant claims priority of U.S. Design Patent Application, Serial No. 29/182,631, filed May 29, 2003.

[0003] Field of the Invention

5 [0004] This invention relates to supporting racks, and more specifically, to racks which support receptacles for bottles or jars.

[0005] Background

[0006] Numerous types of bottle racks are known in the art  
10 for storing diverse items such as bottles of wine, soda, and beer, cans of soda and beer, jars of condiments and other containers for liquids, food products, and the like.

[0007] Racks, which are not designed in a modular fashion, suffer from the disadvantage that the maximum number of items  
15 which the rack may accommodate is fixed and cannot be increased because the structure is fixed.

[0008] Racks which are modular suffer from the disadvantage of requiring that the individual units be fastened together by fasteners and generally require detailed assembly  
20 instructions. Such assembly generally requires tools as well as small fastening pieces such as screws and nuts which may be easily lost. Assembly of such modular units requires time and the method of assembly of the units and assembly instructions may be unduly complicated.

25 [0009] Summary of the Invention

[0010] The invention herein is a rack that can be configured in any of numerous ways to maximize the storage of cans, bottles, and jars (hereinafter collectively referred to as "containers").

30 [0011] Briefly, the invention herein is a modular rack comprising a rack element having a plurality of protrusions and recessions that are configured to interlock with complimentary recessions and protrusions of other rack

elements of generally similar appearance. Preferably, a rack element has protrusions and/or recessions at the top, bottom, and left and right sides. The rack can be expanded in all directions to fill the desired space and support the desired number of containers. The rack elements may be attached together without the need of separate fasteners or tools.

[0012] Additionally, the invention herein is a rack which provides insulation around container accommodating openings so that a relatively constant container temperature will be maintained and, at the same time, ventilation through the container accommodating openings is also provided to, *inter alia*, prevent odor.

[0013] In a preferred embodiment, the invention is a rack that is structured to provide insulation of container accommodating openings by means of a double wall chamber enclosing an insulating air volume and, at the same time, ventilation through container accommodating openings is also provided to, *inter alia*, prevent odor.

[0014] Description of the Drawings

[0015] Fig. 1a is a perspective view of an element of the new rack;

[0016] Fig. 1b is a rear elevational view of an element of the new rack in the orientation of Fig. 1a;

[0017] Fig. 2 is a perspective view of the rack element of Fig. 1 rotated approximately 135° in a clockwise direction;

[0018] Fig. 3 is a front elevational view of an element of the new rack in the orientation shown in Fig. 1;

[0019] Fig. 4 is a front elevational view of a first arrangement of a plurality of elements of the new rack in the orientation of Fig. 1 interconnected;

[0020] Fig. 5 is a front elevational view of a second arrangement of a plurality of elements of the new rack in the orientation of Fig. 2;

[0021] Fig. 6 is a front elevational view of an element of the new rack in receipt of two bottles;

[0022] Fig. 7 is a cross-sectional view taken along line 7-7 of Fig. 6;

5 [0023] Fig. 8 is a cross-sectional view of a second embodiment of my invention taken along line 7-7 of Fig. 6;

[0024] Fig. 9 is a cross-sectional view of a third embodiment of my invention taken along line 7-7 of Fig. 6;

[0025] Fig. 10 is a front elevational view of another  
10 embodiment of my invention; and

[0026] Fig. 11 is a cross-sectional view of another embodiment of my invention taken long line 11-11 of Fig. 10;

[0027] Fig. 12 is a rear elevational view of yet another embodiment of the invention;

15 [0028] Fig. 13 is a cross-sectional view taken along line 13-13 of Fig. 12.

[0029] Description of Preferred Embodiments

[0030] The present invention will now be described more fully hereinafter with reference to the accompanying drawings,  
20 in which preferred embodiments of the invention are shown. The invention, may, however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully  
25 convey the scope of the invention to those skilled in the art. Like reference numerals refer to like elements throughout.

[0031] Referring initially to Figs. 1a, 1b, and 3, there is disclosed therein a rack element 10. The rack element 10 is comprised of a housing 12 having a forward wall 14, a side  
30 wall 16, and a rear wall 17. The rear wall 17 is substantially identical to the forward wall 14. The forward wall 14 has a plurality of container accommodating openings 20 defined by interior walls 22. The interior wall 22 of each of the

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container accommodating openings 20 meet the forward wall 14 at edge 24, and the rear wall 17 at edge 25.

[0032] The forward wall 14 of the housing 12 meets the side wall 16 at forward edge 26. Similarly, the side wall 16 meets  
5 the rear wall 17 at rearward edge 28.

[0033] Each of the interior walls 22 of the container accommodating openings 20 extends from the container forward surface 24 to the rear wall 17. Each of the container accommodating openings has a longitudinal axis and each such  
10 axis may, but is not required to be parallel to each of the other axes.

[0034] The housing 12 has at least one protrusion portion 30 comprised of a head portion 32 and a neck portion 34. The protrusion portion 30 is formed by a portion of the side,  
15 forward and rear walls, 16, 14 and 17, respectively. As will be appreciated, the neck portion 34 of the forward and rear walls is more narrow than the head portion 32 of the forward and rear walls.

[0035] A portion of the side wall 16, forward wall 14, and  
20 rear wall 17 of the housing 12 also defines at least one recession portion 40 defining a head accommodating portion 42 and a neck retaining portion 44.

[0036] The shape of the recession portion 40 is substantially similar to the shape of the protrusion portion  
25 30. However, the size of the recession portion 40 is slightly smaller than the size of the protrusion portion 30. As will be discussed in further detail below, this structure allows slidable interengagement of the protrusion portion and recession portion of the rack elements in the manner described  
30 below.

[0037] Next referring to Fig. 2, there is disclosed therein the rack element 10 of the present invention rotated approximately 135° clockwise from the position of Fig. 1a. As

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will be disclosed in greater detail hereinbelow, the rack elements may be slidably interengaged in various orientations.

[0038] Next referring to Fig. 4, there is disclosed therein a plurality of rack elements 10 in the orientation of Figs. 1a and 3, wherein the rack elements 10 have been slidably engaged so that the protrusion portion 30 is slidably engaged with the recession portion 40 of the adjacent rack element. In such a configuration, the head portion 32 and neck portion 34 of a first rack element are slidably interengaged and are received by the head accommodating portion 42 and neck accommodating portion 44 of a second rack element. In such a configuration, the side wall surface 16 of the protrusion portion 30 abuts the side wall surface 16 of the recession portion 40.

[0039] As will be appreciated, the interengagement of the protrusion portion and recession portion is accomplished by sliding the protrusion portion into the recession portion. In such a configuration, the neck retention portion will prevent the protrusion portion of the adjacent rack element from separating from the adjacent rack element, except in a direction perpendicular to the forward surface 14 of the housing 12, that is, the protrusion portion 30 and recession portion 40 are slidably interengaged in a direction parallel to the side wall 16.

[0040] This interengagement produces a highly stable modular rack which is capable of expansion without the need for rearranging rack elements which have already become part of the modular rack. The modular rack is strong, easy to assemble, and the addition of additional rack elements is quick, easy and does not require the use of external fasteners or tools. Assembling the rack elements also does not require detailed instructions which might be lost or misplaced.

[0041] Next referring to Fig. 5, there is shown a modular assembly of rack elements 10 in the orientation of Fig. 2. As will be appreciated, the rack elements in this orientation are

similarly engaged with adjacent elements in the manner and pursuant to the structure set forth above. Such an arrangement is stable and allows expansion with ease and without the need for external fasteners or the like. It is advantageous to use this particular orientation of the modular rack adjacent or in areas such as next to staircases and the like which benefit from having the modular rack form an arrangement having a triangular or diagonal configuration.

[0042] Next referring to Figs. 6 and 7, there is disclosed therein a rack element 10 in which bottles 60 (shown by dashed lines) have been placed for storage. As will be appreciated by those having ordinary skill in the art, storage of bottles with their longitudinal axes parallel to the ground is in many instances highly advantageous. For example, with respect to the storage of wine bottles, it is preferred to store such bottles in such an alignment so that the liquid in the bottle is in contact with the cork stopper. In this configuration, the liquid will tend to keep the cork stopper (not shown) moist and, consequently, the seal provided by the cork stopper will more likely be maintained.

[0043] The rack elements may be manufactured of wood, metal, plastic, foam or other similar materials. When the rack is manufactured of plastic or similar materials, the rack may be manufactured by processes such as by injection, blow or rotational molding, or formed by a casting process, which manufacturing processes are well known to those having ordinary skill in the art.

[0044] The container accommodating openings 20 are shown in the drawings as cylinders having circular cross sections. However, container accommodating openings of elliptical, triangular, square, rectangular, pentagonal, etc., cross-section are also possible and within the scope of the invention.

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[0045] Next referring to Fig. 8, there is disclosed therein another preferred embodiment of the rack element. In this construction, the rack element is hollow and the orientation between the forward wall 14 and the rear wall 17 is maintained by the side wall 16 and the container interior walls 22. The remainder of the interior of the housing 12 contains air. Such a structure is extremely light, but is rigid and capable of supporting containers. Also, the air within the rack element acts as an insulator. Such a construction also enables the rack element to provide thermal insulation of containers within the container interior walls 22 while at the same time providing ventilation for the containers. This is of importance for certain containers such as wine bottles, which should be stored horizontally, protected from temperature fluctuation and light induced damage while at the same time providing adequate ventilation.

[0046] Next referring to Fig. 9, there is disclosed therein another preferred embodiment of the rack element, wherein the orientation of the forward wall 14 and the rear wall 17 is maintained solely by the side wall 16. In this embodiment, a container accommodating flanges 20a extend inwardly defining openings 20a in the forward wall 14 and rear wall 17. In this embodiment, containers may be stored so that the longitudinal axis of the bottles are parallel to the ground as with container 60 or, alternatively, containers may be positioned so that the respective longitudinal axes will form an acute angle with the horizontal, such as illustrated with container 60a in Fig. 9. In certain situations, this is highly desirable if the liquid level in the container is low and it is necessary for the liquid to cover the stopper such as to prevent the stopper from drying out.

[0047] The embodiment of Fig. 9 is also desirable because it is light, and inexpensive to manufacturer. It may also be formed of a plastic by rotational molding or blow molding

which are manufacturing techniques well known to those having ordinary skill in the art.

[0048] Next referring to Figs. 10 and 11, there is shown therein yet another alternative preferred embodiment of the invention which is preferably made by an injection molding process, and wherein the rack element 11 comprises forward and rear element halves 10a and 10b which meet at seam 11. The interior surfaces 22 of the container accommodating openings 20 have a plurality of ribs 65 extending longitudinally along the interior surface of the container accommodating interior walls 22. Near the seam 11 of the forward element half 16a, the ribs 65 are of slightly lower height than near the forward surface 14. Similarly, near the seam 11 of the rear element half 16b, the ribs 65 are of slightly lower height than the portion of the ribs 65 near the rear surface 17. This slight asymmetry is preferable due to asymmetry of the rack element. Such asymmetry may be due to the necessity to provide a draft in each of the forward and rear element halves 10a and 10b in order to easily remove each half from the mold, i.e., the interior angles between the forward wall 14 and the interior walls 22 of the container accommodating openings 20 and the interior angles between rear wall 17 and the interior walls 22 of the container accommodating openings 20 may be slightly greater than 90 degrees to enable the rack elements to be easily removed from the mold. In a preferred embodiment, these interior angles are 91°. The ribs are structured to compensate for this and to position the containers horizontal to the ground so that environmental vibration will not tend to cause the containers to travel or slip out of the container accommodating openings.

[0049] In such a structure, the containers will also be more securely retained in that they will not be subject to rolling within the container accommodating interior walls 22 or slipping out. For example, if the surface on which the rack



is positioned is subject to vibration, the container will be less likely to rock within the container accommodating interior walls. As will be appreciated to those with ordinary skill in the art, if the container accommodating walls 22 are not parallel to the ground, containers may tend to slip out if the ribs 72 are omitted.

[0050] It will be appreciated that ribs may also be positioned circumferentially within the container accommodating interior walls. In such a structure, ribs will be positioned along the circumference of the container accommodating interior walls. Such a structure may be desirable in circumstances in which a user may not want the surface of the container to abut the interior surface of the container accommodating walls along the length of the opening. For example, a user having a rare, fine wine may want to avoid damaging or marring the wine label. In such circumstances, circumferential ribs in the container accommodating opening would prevent the label of the container from being marred or damaged.

[0051] In this alternative preferred embodiment, the rack element 10 is comprised of two element halves, a forward element half 10a and rear element half 10b. The forward and rear element halves 10a and 10b meet at seam 11. The forward and rear elements halves 10a and 10b are held together by glue or other attachment means well known to those having ordinary skill in the art.

[0052] Leveling ridges 13 are also provided where, because of the draft, the sidewall 16 is not perpendicular to the forward or rear walls, 14 and 17. The leveling ridges 13 increase in thickness as the distance from the seam increases. The increase in thickness of the leveling ridges is an amount to compensate for the sidewalls 16a and 16b not being perpendicular to the forward wall 14 and rear wall 17,

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respectively, thus maintaining the stability of the rack element 10 on the supporting surface (not shown).

[0053] Referring now to Figs. 12 and 13, there is disclosed another preferred embodiment of my invention. The rack

5 element 10 is shown with an electrical light assembly affixed to the rear wall 17. The light sources comprise a two element electrical cord 75, a bulb socket 77, and a light source 79. In a preferred embodiment, the light source may comprise a light emitting diode or some other light source which does not  
10 generate heat. Such light sources may be of various glass and difference colors may be utilized in difference rack elements. In this embodiment, the rack element may be comprised of polypropylene or other transparent or semi-transparent material. In this configuration, the effect of the light of a  
15 single rack element and a plurality of each effect of the light of a single rack element and a plurality of each elements is esthetically pleasing to the observer without degrading the advantages of the invention.

[0054] Many modifications and other embodiments of the  
20 invention will come to mind to one who is skilled in the art to which this invention pertains having the benefit of the teachings presented in the above-description and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments  
25 disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic or descriptive sense only and not for the purpose of limitation.